Particle Physics on the Plains 2022



Contribution ID: 13

Type: not specified

Searching for new physics in the Higgs-top coupling at high scales and in $t\bar{t}Z$ production using angular moments

Saturday 2 April 2022 11:50 (20 minutes)

The top-quark Yukawa coupling y_t is the strongest interaction of the Higgs boson in the Standard Model (SM) with $y_t \sim 1$ and would be most sensitive to physics beyond the Standard Model. The top Yukawa can be directly measured at the LHC via top pair production in association with a Higgs boson, $t\bar{t}h$. We study new physics effects for the Higgs-top coupling at high scales, using jet substructure techniques. We present the high-luminosity LHC sensitivity to new physics parametrized in the EFT framework and through a general Higgs-top form factor. We also study the $t\bar{t}Z$ process, where the angular moments for the Z-boson can be used as analyzers for the underlying production dynamics. Again working in the EFT framework up to dimension-six, we show the sensitivity to new physics, assuming 3 ab⁻¹ of data at the 14 TeV LHC.

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